Proto-Anatolian as a mora-based language1

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PROTO-ANATOLIAN AS A MORA-BASED LANGUAGE[1]

1. INTRODUCTION

The difficulty in obtaining prosodic evidence from documents written in ancient languages which no longer have any native speakers is always an obstacle to the development of historical linguistic research. In written documents, linguistic contrasts in prosody are rarely expressed by means of letters. In spite of this difficulty, however, it is not always impossible to obtain prosodic evidence even from dead languages by using the techniques of historical linguistics.

In the case of the Anatolian languages, now well established as the oldest branch of the Indo-European language family, the so-called scriptio plena (or plene writing, i.e. doubling of a vowel as seen in *wa-a-tar* 'water') in Hittite has attracted scholars' attention since the language's decipherment in the earlier half of the twentieth century, sparking controversies regarding the question of what it stands for. A view which has now gained considerable support is that it expresses vowel length, whether the relevant vowel is accented or not.[2] Aside from this issue, very little is known about the prosodic aspects which characterize the Anatolian languages.[3]

In the present study we attempt to show that the basic units which carried accents in Proto-Anatolian were not syllables, but morae. Unlike linguistic research focusing on modern languages, the evidence in favor of this view is inevitably indirect. But the historical and comparative analyses of the data shown below provide substantial support for the validity of this claim. The morphological category which will play a cardinal role in the following discussion is the mediopassive verb, in which some Anatolian languages have word final *-r* or *-ri* in the present tense.

2. THE PREHISTORY OF FINAL *-r* IN MEDIOPASSIVE ENDINGS IN INDO-EUROPEAN

[1] Parts of this work have been presented to audiences, including Friedrich-Alexander-Universität Erlangen-Nürnberg, the 27th East Coast Indo-European Conference at the University of Georgia and Universität zu Köln. I very gratefully acknowledge discussions with Norbert Oettinger, Craig Melchert and José Luis García-Ramon on these occasions. I would also like to express my heartfelt gratitude to the two anonymous reviewers for their detailed and helpful comments on an earlier version of this paper. Whatever errors remain, however, are entirely my own responsibility.

[2] Cf. Hart (1980), Carruba (1981), Watkins (1982), Kimball (1999: 56ff.) and Hoffner & Melchert (2008: 25), among others.

[3] Although Hittite is still the primary source of the Anatolian database, documents in other Indo-European languages of ancient Anatolia are also known: e.g. Palaic and Cuneiform Luvian, both recorded in the second millennium BC; Hieroglyphic Luvian, the overwhelming majority of the documents of which are from the first millennium BC; and Lycian and Lydian, both from the first millennium BC.

Before the decipherment of Hittite and Tocharian early in the twentieth century, the *r* element attached to mediopassive endings was simply regarded as a marginal feature peculiar to Italo-Celtic; e.g. Lat. pres. 1SG *agor* 'I am driven', 3SG *agitur*, 1PL *agimur*, 3PL *aguntur*, Old Irish deponent pres. conjunct 1SG *-suidigur* 'I place', 2SG *-suidigther*, 3SG *-suidigedar*, 1PL *-suidigmer*, 3PL *-suidigetar*. Meillet (1964: 235)[4] and Brugmann (1916: 657ff.) suggested that the *-r* characterized impersonals which were isolated in Proto-Indo-European morphology.

Hittite and Tocharian, however, also turned out to employ mediopassive endings with the *r* element; e.g. Hitt. 1SG *arḫari* 'I stand', 3SG *artari*, 3PL *arantari*, Toch A [B] 1SG *mäskamār* [*mäskemar*] 'I am', 2SG *mäskatār* [*mäsketar*], 3SG *mäskatär* [*mäsketär*], 1PL *mäskamtär* [*mäskemt(t)är*], 2PL *mäskacär* [*mäsketär*], 3PL *mäskantär* [*mäskentär*]. This discovery has established that the *r* element goes back to the parent language. Comparative evidence from Italic, Celtic, Tocharian and Anatolian indicates that Proto-Indo-European present mediopassives were characterized by *-r* at least in the third and possibly also in the first person.[5] In Latin and Old Irish, *-r* is both primary and secondary, but Hittite and Tocharian employs *-r* exclusively in the primary endings. *Pace* Meillet and Brugmann, *-r* had nothing to do with impersonals nor was it a marginal feature peculiar to Italo-Celtic.

In Indo-Iranian and Greek the basic mediopassive endings are apparently enlarged by the *hic et nunc particle -i* in the primary endings: Skt. 1SG *-e*, 2SG *-se*, 3SG *-(t)e*, 3PL *-nte*, Gk. 1SG *-mai*, 2SG *-sai* (Arcado-Cypriote *-soi*), 3SG *-tai* (Arc.-Cypr. *-toi*), 3PL *-ntai* (Arc.-Cypr. *-ntoi*). Gothic has 1SG *-da*, 2SG *-za*, 3SG *-da*, 3PL *-nda*, where the *-a* can be explained by loss of final **-i*.[6] The *i*-ending of Indo-Iranian, Greek and Germanic were analogically recreated on the proportion: secondary active endings **-m*, **-s*, **-t*, **-nt* : primary active endings **-mi*, **-si*, **-ti*, **-nti* = secondary mediopassive endings **-h_2e*, **-th_2e*, **-o*, **-nto* : primary mediopassive endings X_1, X_2, X_3, X_4, with X_1 = **-$h_2$ei*, X_2 = **-th_2ei*, X_3 = **-oi*, X_4 = **-ntoi*. It is significant that this remodeling is limited to the languages which are generally assumed to have remained unified after Anatolian,

[4] The first edition appeared in 1903.
[5] *-r* is lacking in the second person of Latin and in the 2PL of Old Irish. In both languages the *-r* spread to the secondary endings as well, which is obviously an innovation. The palatalized quality of final *-r* in Old Irish deponent absolute 3SG *-thir* and 3PL *-tir* are explained either by analogical influence on **-r* from the active endings (e.g. absolute 3SG *benaid* 'strikes', 3PL *benait* vs. conjunct 3SG *-ben*, 3PL *-benat*) or through a particle **-es* added to the absolute forms within Cowgill's framework (cf. Cowgill 1975a: 40ff. and 1975b: 27ff.). The *r*-endings in Latin and Tocharian are directly inherited from the PIE period.
[6] Cf. Krahe & Meid (1969: 135), who argue that Runic *haite* 'I am called' and Old Icelandic *heite* indicate **-ai*.

Tocharian, Italic and Celtic split off from the rest of the family, presumably in this order.[7] As for Baltic and Slavic, the morphological mediopassives were completely lost. The prehistory of the mediopassive *r*-ending in the individual branches has been roughly shown above except in Anatolian, which has a unique internal history, as is shown in the next section.

3. The prehistory of final *-r(i)* in mediopassive endings in Anatolian

The 3SG mediopassive present endings reconstructed for Proto-Indo-European are unaccented **´-or* and accented **-ór*.[8] These two endings are inherited intact in early Proto-Anatolian. In Yoshida (1990: 118), unaccented **´-tor* was reconstructed in addition to unaccented **´-or* and accented **-ór*. But it is unlikely that the ending **´-tor* existed in Proto-Indo-European because the encroachment of **t* of the 3SG active on the corresponding 3SG mediopassive ending was still in progress in the historical period of Hittite as shown in detail in Yoshida (2007a); e.g., *ḫalziya* 'is called' in Old Hittite manuscripts → *ḫalziyattari* in a Neo-Hittite copy of an Old Hittite text, *ḫāliya(ri)* 'kneels' in Neo-Hittite copies of Old Hittite manuscript → *ḫaliyattat* 'knelt' in a Neo-Hittite historical text. The reconstruction of **-to* for Proto-Indo-European would inevitably oblige us to regard the speed of this morphological change as exceptionally slow. It would turn out that the change was in progress for more than 3,000 years from PIE down to the Neo-Hittite stage. Because linguistic change over such a long span of time is simply unlikely, the ending **-to* cannot have been created in the parent language.

The unaccented **´-or* and accented **-ór* changed to **´-o* (< **´-or*) and **-óri* (← **-ór*) in late Proto-Anatolian after the final *-r* loss, which occurred unless **-r* was immediately preceded by an accented vowel. The final *-i* of **-óri* is transferred from the active (cf. Yoshida 1990: 115). The accented **-óri* is reflected in e.g. *iš-kal-la-a-ri* 'tears up' with scriptio plena *-a-* in the ending. That the 3SG **-óri* is the original locus of Hittite *-ri* is indirectly borne out by a frequently occurring pattern, i.e. 3SG *-ari* : 3PL *-anta*, which shows the preference of *-ri* for the 3SG over the 3PL. This distributional pattern is found in the Old Hittite pair *ḫat<ta>ri* 'strikes' KBo XXV 29 II 4 and *ḫattanta* KBo XXV 29 II 6, which is of great importance because this pair is attested in one and the same manuscript and the two members of the pair occur within two lines of each other.[9] It is

[7] Such an approach to subgrouping the Indo-European family has gained widespread acceptance in recent years; see especially Melchert (1998: 25f.), Ringe (1998: 43) and Garrett (1999: 147).
[8] Since the number of attested forms in the first and second persons is too small to be statistically meaningful, the following discussion has to be limited to the third person forms.
[9] There is no evidence that *ḫat<ta>ri* goes back to **-óri*, but inner-Hittite data shows that *-ri* was extended from its original locus to the unaccented **-o* before it spread to the third person plural; cf. Yoshida (1990: 114). The paucity of *-ri* in the third person plural in Old Hittite is explained by

significant that the same pattern is found in Palaic, where the verb *ḫā-* 'be warm' is attested in the forms of *ḫa-a-ri* (3SG) and *ḫa-a-an-ta* (3PL) on the same line of a single manuscript (KBo XIX 152 I 14). This coincidence is so striking that the pattern *-ari* : *-anta* must go back to Proto-Anatolian. Accordingly, the loss of final *-r* and *i*-attachment must have occurred in Proto-Anatolian as well. Palaic *kītar* 'lies' and Cun. Luv. *ziia̯r* 'id.' must be considered as secondary products due to apocope that occurred in their individual prehistories, *pace* Neu (1968: 142), Watkins (1969: 78) and Cowgill (1975c: 561).

Among the Proto-Anatolian 3SG present mediopassive endings **´-o* and **-óri*, the former, which was undercharacterized as the 3SG present mediopassive, needed to be more clearly marked as such. To save this situation, the *r*-less **´-o* underwent one of the following three different morphological changes in the individual histories of the Anatolian languages.

(1) **-o → *-to(ri)*
(2) **-o → *-oto(ri)*
(3) **-o → *-o-ri*

One is **-o → *-to* as seen in Old Hittite *šuppiyaḫḫati* 'cleaned' which was later replaced by *šuppiyaḫtari* 'cleans'. An identical transformation is observed in Classical Sanskrit *śete* (< **-to-i*) 'lies' in contrast to Vedic *śaye* (**-o-i*). A second morphological change is **-o → *-oto*, which presupposes the prior existence of the first morphological change, i.e. **-o → *-to*, as was correctly pointed out by Watkins (1969: 86). This change is illustrated by later Hittite *ḫalziyatari* 'calls' which replaced Old Hittite *ḫalziya*. The new form is comparable to the Sanskrit type *juṣate* 'enjoys' (< **-o-to-i*). The outputs which resulted from the application of these two morphological replacements came to be further extended by *-ri*, which was originally proper to a descendant of the accented **-óri*. The element *-ri*, which was virtually limited to the 3SG of the *a*-class mediopassive in Old Hittite, gradually spread to the 3SG of both the *ta-* and *ata*-classes in Middle Hittite and became almost obligatory in Neo-Hittite. A third morphological change is the attachment of *-ri* directly to the undercharacterized **´-o*. This change is not accompanied by the encroachment of **t* of the 3SG active, as illustrated by Old Hittite *eša* 'sits' which was later replaced by *ešari*.

As for the accented **-óri*, on the other hand, it is faithfully preserved in Hittite. Notice that the mediopassives in *-a-(a)-ri* with occasional scriptio plena *-a-* consistently resisted the intrusion of the active *-t*, as illustrated by *iš-kal-la-a-ri* 'tears up',

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assuming that the accent in **-n̥tór* was retracted from the **-o-* to the preceding **-n̥-* like Vedic Sanskrit *bruváte* 'they say' (< **-ń̥toi* < **-n̥tói*).

iš-du-wa-a-ri 'becomes evident', *ša-ḫa-a-ri* 'pollutes', *tu-ug-ga-a-ri* 'is of importance'.[10] There are no definite cases of the 3SG present mediopassive verb with an original accented ending **-ór* having undergone the morphological change *-ari* → *-ttari* or *-ari* → *-attari* throughout the whole historical period of Hittite. Since the accented ending *-ári* was uniquely characterized as the 3SG present mediopassive by its accent and the element *-ri*, there was no motivation for either of the above transformations.

4. Apparent counterexamples to the above observation

There are, however, apparent counterexamples to the observation made in the last paragraph of the preceding section: the accented ending *-ári* was preserved intact. They are *šiyēttari* 'is pressed' and *laḫuttari* 'is poured', both of which are attested in Neo-Hittite manuscripts. The following subsections will be devoted to discussing these irregular forms.

4.1. šiyēttari 'is pressed'

šiyēttari KBo XXV 163 Rs. V 6 is recorded in a Neo-Hittite copy of an Old Hittite ritual text as shown below.[11]

(4) *nu* 7-*an* 7-*an anda išḫiškanz[i]* / *nu išḫiyatar ANDAḪŠUM*^{SAR} *iyan*[*zi*…] / *namma=at anda šiyēttari* […] 'They tie seven and seven (*ANDAḪŠUM*-plant) together […] They make a bundle (of) *ANDAḪŠUM*-plant. … Then it (the bundle?) is pressed together.'[12]

šiyēttari is a hapax. The 3SG present mediopassive of the verb *šai-/šiya-* belongs to the *a*-class mediopassive, and it is spelled *ši-ya-ri*. There is also *ši-ya-a-ri* KBo III 16 Vs. 8, with scriptio plena *-a-* in the ending in an Old Hittite text. Since the accented ending *-ári* is guaranteed, *ši-ya(-a)-ri* is expected to remain intact. However, there is *šiyēttari*, which at first glance seems to be a counterexample to our theoretical prediction. Following the communis opinio, *šai-/šiya-* 'squeeze, press' is a *ḫi*-verb with a strong stem *šai-* (< **seh*$_1$*-i-*) and a weak stem *šiya-* (< **sh*$_1$*-i-*) in spite of the attestation of mixed forms combining *mi-* and *ḫi*-conjugations. According to Jasanoff (2003: 93), *šai-/šiya-* belongs

[10] See Yoshida (1990: 96f.) for additional examples. The scriptio plena in these examples reflects the position of the accent.

[11] The names of the cuneiform text series are abbreviated as follows:
KBo = Keilschrifttexte aus Boghazköi. Berlin.
KUB = Keilschrifturkunden aus Boghazköi. Berlin.

[12] The translation is from Güterbock et al. (2002: 20).

to *i*-presents of the *ḫi*-conjugation.

In this connection Oettinger (1979: 473) makes the interesting observation that while the active of this verb was transformed on a large scale starting from the late Old Hittite period (for example, *ši-i-e[-(et)]* and *ši-ya-it* with the *mi*-verb ending), its mediopassive remained unchanged (e.g. *ši-ya-ti* KUB XXXVI 101 II 9). Particularly noteworthy is that among the two active forms that he cites, *ši-i-e[-(et)]* KUB XXXIII 10 Vs. 5 is already attested in a Middle Hittite copy of an Old Hittite text. Accordingly, we are naturally led to the view that the mediopassive *šiyēttari* in a Neo-Hittite manuscript is a relatively late creation based on medialization, with the productive ending *-ttari* attached to the stem *šii̯e-* of the 3SG active *ši-i-e[-(et)]*.

4.2. laḫuttari 'is poured'

laḫuttari KUB XIII 8 Vs. 8 is attested in a Neo-Hittite copy of the Middle Hittite text *Totenrituale* as shown below.[13]

(5) Ì-*an-ma-kán la-ḫu-wa-ta-ri*^{sic} *a-pu-uš-ma-kán pa-ra-a le-e ú-wa-an-zi*
'Öl wird ausgegossen, jene aber kommen nicht heraus.'

The usual 3SG present mediopassive of this verb is *la-ḫu-wa-a-ri* KBo III 29 Vs. 11 or *la-ḫu-u-wa-a-ri* KUB XXV 37 I 26, 27, with consistent scriptio plena *-a-* in the ending. Scholars' readings of the deviant form *laḫuttari* were not always the same. Like Otten, Friedrich (1991: 125)[14] earlier offered the broad transcription *laḫuwatari?* with a question mark. Güterbock & Hoffner (1980: 13) read it as *la-ḫu-ut*$^{?}$*-ta-ri* with a question mark on *ut*. But Puhvel (2001: 18) reads it as *la-ḫu-ut-ta-ri*, not as *la-ḫu-wa-ta-ri*. The reading *la-ḫu-ut-ta-ri* is obviously preferred because *la-a-ḫu-ut-ta-ri* is actually recorded in an unpublished tablet, 829/z, as pointed out by Güterbock & Hoffner and by Puhvel. Again, the original *la-ḫu-wa-a-ri*, with the accented ending, seems to have been morphologically transformed, contrary to our prediction.

The verb *laḫuwa-* is a *ḫi*-verb. As the data collected by Oettinger (1979: 422) and Güterbock & Hoffner (1980: 13) undeniably show, the majority of earlier attested forms of this verb indicate that the original stem was *laḫu-*; e.g. 2SG.PRES *la-aḫ-ḫu-ut-ti* KUB XXX 34 IV 14, 1PL.PRES *la-ḫu-e-ni* KBo XIX 156 II 15, 1SG.PRET *la-a-aḫ-ḫu-uš* KUB XXXIII 24 II 8. Jasanoff (1979: 88) assumes that this verb is characterized by the ablaut, the root-accented **léh$_2$-u-* in the strong form and the ending-accented **lh$_2$-u-ˊ* in the weak

[13] The translation is from Otten (1958: 106f.).
[14] The first edition appeared in 1952.

form.[15] Especially striking is the 3SG.PRES *la-a-ḫu-i* KBo XVII 1 I 16, 17 (+ IBot I 26, 16, 17) in an Old Hittite original manuscript in contrast to *la-a-ḫu-wa-i* KUB VIII 2 Vs. 8 in a Neo-Hittite text. The secondary stem *laḫuwa-* with a thematic extension *-a-* was undoubtedly back-formed from 3PL *laḫuwanzi*.

Thus, the process by which *laḫuttari* has emerged is now clear. It must have been produced by attaching the productive 3SG mediopassive ending *-ttari* to the stem of the original 3SG active *lāḫui* in a parallel fashion to the one observed in *šiyēttari*.[16]

5. OTHER EXAMPLES OF MEDIALIZATION

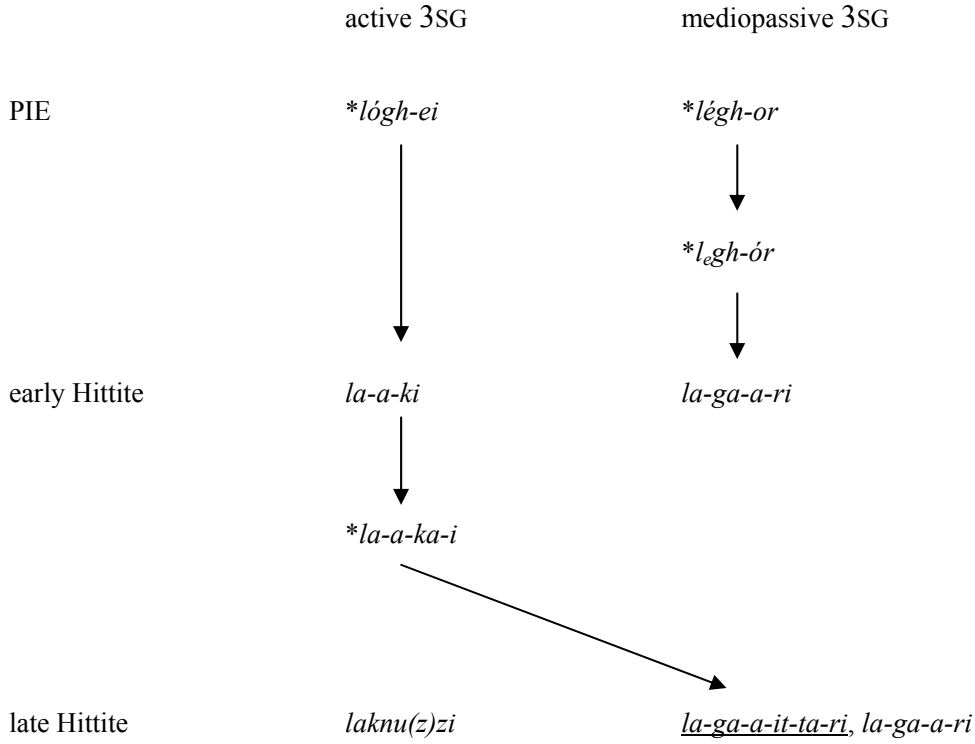
The apparent counterexamples, *šiyēttari* (vs. usual *ši-ya-a-ri*) and *laḫuttari* (vs. usual *la-ḫu-wa-a-ri*) are both attested in Neo-Hittite manuscripts and are best explained as medialized forms of the corresponding active *ši-i-e[-et]* (OH+) and *la-a-ḫu-i* (OH). We may legitimately wonder if there are any other examples of medialization in Hittite. As far as I know, there are at least two additional examples, that is, *lagāittari* 'lies, is laid (low)' and *išḫuwaittat* 'scattered', which are briefly touched on in sections 5.1 and 5.2, respectively.[17]

5.1. *lagāittari* 'lies, is laid (low)'

In addition to the familiar *la-ga-a-ri* (*la-qa-a-ri*) 'lies, is laid (low)' with the scriptio plena *-a-* in the ending, Hittite provides us with a peculiar Neo-Hittite form *la-ga-a-it-ta-ri* KUB V 7 Vs. 18, which again at first seems to have undergone the morphological transformation contrary to our prediction. A close examination of the internal history of this verb, however, makes it unlikely that *lagāittari* was directly derived from *lagāri*. The prehistory of *lagāittari* is schematically summarized below.

[15] This view is followed by Melchert (1994: 72).
[16] Strictly speaking, the historical derivations of *laḫuttari* and *šiyēttari* are not completely parallel as pointed out to me by an anonymous reviewer. While *-ttari* was directly attached to an original stem in the former case, a secondary remodeling of an original *ḫi*-verb stem into a *mi*-verb stem was involved in the latter case.
[17] A detailed analysis of these two forms is presented in Yoshida (2007b: 131ff.).

(6)



The ablaut pattern of the active *lāki* and the mediopassive *lagāri* is an archaic feature which is still faithfully preserved in early Hittite.[18] In late Hittite, however, the active *lāki* came to be supplanted by *laknu(z)zi* 'makes lie, knocks over', as was correctly observed by Oettinger (1979: 425) and Puhvel (2001: 33). This situation would have inevitably made the functional status of the secondarily created active **lākai* rather opaque. The theoretically expected **lākai* is not recorded anywhere. However, the assumption of its existence seems very reasonable considering many attested 3SG present *ḫi*-verbs in *-ai* such as *la-a-ḫu-wa-i* 'pours' from *la-a-ḫu-i*, *mallai* 'grinds' KUB XXV 23 IV 52 from *malli* KUB VII 1 II 1, *gangai* 'hangs' KUB VII 60 II 6 from *kānki* KBo XVII 2 I 7, *šarrai* 'divides' KBo V 9 II 37 from *šarri* KUB XXXV 4 III 7, *ārrai* 'washes' KBo III 5 IV 48 from *ārri* KBo X 45 IV 37, etc. In order to avoid the functional opacity inherent in it, **lākai* came to be medialized by the attachment of the productive mediopassive 3SG ending *-ttari*, together with the accent shift under the influence of the genuine mediopassive *lagāri*.[19]

[18] According to Jasanoff (2003: 150ff.), *lak-* is assumed to be originally a protomiddle of the h_2e-conjugation root aorist characterized by the ablaut pattern **lógh-* : **légh-*. The transfer of the accent from the root to the ending (**légh-* → **l$_e$gh-ór*) is easily understood by the fact that weak forms tend to take zero-grade root and shift the accent to the ending; cf. Sanskrit *stáuti* 'praises' : *stuvánti* ← *stéu-ti* : **stéu̯-n̥ti*.

[19] An anonymous reviewer has called my attention to the problem why *lāḫuwaittari* was not created from *lāḫuwai* in a fashion similar to how *lagāittari* was created from **lākai*. It seems to me conceivable that the functional opacity in **lākai* caused by the replacement of *laknu(z)zi* for *lāki*

5.2. *išḫuwaittat* 'scattered'

This irregular mediopassive is attested twice in a fragment of a Middle Hittite text in the broken form of *[iš-ḫu]-wa-it-ta-a[t]* KBo VIII 96 Vs.? 1 and *[i]š-ḫu-wa-it-ta-at* KBo VIII 96 Vs.? 2. These forms must be late because of the final apocopated *-t*, not *-ti*. It is a well-known fact that the apocopated *-t* is characteristic of later Hittite; cf. Friedrich (1960: 79). The stem of the form is generally considered to be *išḫuwa-* in standard dictionaries such as Friedrich (1991: 87) and Tischler (1978: 393ff.). However, older forms like 1SG.PRES *iš-ḫu-uḫ-ḫi* KUB XXXI 84 III 63 in a Neo-Hittite copy of a Middle Hittite text, 1SG.PRET *iš-ḫu-u-uḫ-ḫu-un* KUB XVII 10 III 7, *[iš-ḫ]u-uḫ-ḫu-un* KUB XV 34 II 44, both in Middle Hittite manuscripts, and 3SG.PRES *iš-ḫu-i* KBo II 3 II 32 in a Neo-Hittite copy of a Middle Hittite text, in contrast to later forms like 1SG.PRES *iš-ḫu-wa-aḫ-ḫi* KUB XV 11 II 9 in a Neo-Hittite manuscript and 3SG.PRES *iš-ḫu-wa-i* KBo II 9 IV 5, KUB XXIV 9 II 19, KUB XXIX 1 IV 19, *iš-ḫu-wa-a-i* KBo V 2 II 20 and *iš-ḫu-u-wa-i* KUB II 7 I 12, KUB XLIV 61 Rs. 11 and *iš-ḫu-u-wa-a-i* KUB XLIV 63 II 19, all in Neo-Hittite manuscripts, guarantee that the stem is originally *išḫu-*, not *išḫuwa-*

The mechanism of the stem change from *išḫu-* to *išḫuwa-* is completely parallel to the one seen in **lākai* from *lāki.* The remodelled 3SG *išḫuwāi* or *išḫuwai* was undoubtedly created during the inner history of Hittite, since the older 3SG *išḫui* is attested as well. It is clear that *išḫuwaittat* is a medialized form created by attaching the productive 3SG mediopassive preterite ending *-ttat* to the active 3SG *išḫuwai* in a manner identical to the process of deriving *lagāittari* from **lākai*.[20]

6. INTERIM SUMMARY

The present mediopassives with the ending *-ári* resisted any morphological change during the inner history of Hittite. Since the ending *-ári* was uniquely characterized as the 3SG.PRES mediopassive by the accented ending and the element *-ri*, there was no motivation for any morphological transformation. Although *šiyēttari* and *laḫuttari* at first sight seem to be counterexamples, neither of them underwent the change **-o* → **-to* or **-o* → **-oto*, which occurred in many other Hittite mediopassives. They are both due to the medialization that was applied to their corresponding active verbs *šiyēt* and *lāḫui*.

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motivated the direct attachment of *-ttari* to the finite form.

[20] Again, the question why *išḫuttat* was not created instead of the attested *išḫuwaittat* might be raised. It should be noted that there is a remodeled 3SG *mi*-form *išḫuwāizzi* besides *išḫuwāi*. *išḫuwaittat* must be due to the attachment of the mediopassive ending to the newly created stem *išḫuwāi-*.

7. A PROBLEMATIC CASE: NASAL-INFIX PRESENTS

As a result of the discussion in the preceding sections, it has become clear that there are no unambiguous cases where mediopassive verbs with the accented ending *-*óri* underwent a morphological transformation during the historical period of Hittite. Viewing this issue from the wider Indo-European standpoint, however, we are confronted with a problematic case. This is nasal-infix presents.

Nasal-infix present verbs reconstructed for Proto-Anatolian as well as Proto-Indo-European are characterized by an accented *é*-grade infix in the 3SG active (PA *-*né-C-ti*) and an accented *ó*-grade ending in the 3SG mediopassive (PA *-*n-C-óri*). If our present analysis is correct, the 3SG.PRES mediopassive of this class would have the accented ending -*ári*, i.e. spelled -*Ca-a-ri* with optional scriptio plena -*a*-. Contrary to our expectation, however, the actual form has -*attari*. There are at least two 3SG.PRES mediopassives attested in Hittite which are safely regarded as descendants of the Proto-Indo-European nasal-infix class. They are *zinnattari* 'is finished' and *duwarnattari* 'breaks', both of which have root-final laryngeal h_1. These two problematic forms are discussed in this order in sections 7.1 and 7.2.

7.1. zinnattari 'is finished'

Oettinger (1979: 150ff.) has convincingly derived *zinna*- from a nasal-infix present with root-final h_1. According to him, the 3SG.PRES active is reconstructed as *si-$né$-h_1-ti with an accent on the infix, and the 3PL.PRES active *si-n-h_1-$énti$ with an accent on the ending. Kloekhorst (2008: 1037) reconstructs *ti-$né$-h_1-/*ti-n-h_1- with root-initial *t, not *s, noting its semantic connection with Hitt. *zē(y)a*- 'to be cooked'.[21] The double -*nn*- in 3SG.PRES *zinnez[i]* (Old Hittite) and *zinnezzi* (later Hittite) is secondarily introduced from the plural *zinnanzi*, where the double -*nn*- is a regular phonological outcome from the sequence *n* plus laryngeal in intervocalic position; cf. Melchert (1994: 80). The preform theoretically posited for the 3SG.PRES mediopassive is *ti-n-h_1-$ór$ (or *si-n-h_1-$ór$ per Oettinger), which would have phonologically become **zinnāri*. But the actually attested form is *zinnattari*.

7.2. duwarnattari 'breaks'

[21] Kloekhorst (2008: 1033) reconstructs the new root *$tieh_1$- for Hittite *zinna*- and *zē(y)a*-. The root generally posited for these verbs is *$te\underset{\frown}{i}h_1$-, not *$tieh_1$-; cf. Rix (2001: 617). Though his reconstruction apparently has merit in accounting for the initial affrication of *zē(y)a*- straightforwardly, I fail to understand the alleged loss of *i* after affrication.

As for *duwarna-,* Oettinger (1979: 151) derived it from a nasal-infix present with root-final h_1 as well: 3SG active *$dhwr̥$-né-h_1-ti*, 3PL active *$dhwr̥$-n-h_1-énti*. This derivation was refuted by Melchert (1984: 36), who argues that *$dhwr̥$-né-h_1-ti* would become **durne-* because postconsonantal *-$wr̥$-* leads to *ur* in Hittite. This is evidenced by e.g. *ḫurne-* 'sprinkle' < * $h_2wr̥$-né-h_2. He therefore reconstructed a denominative paradigm, i.e. 3SG active **dhwerne-yé-ti* and 3PL active **dhwerne-yé-nti*. In order to explain the intervocalic single *-z-* in Old Hittite *du-wa-ar-né-zi* KBo VI 3 III 70, Yoshida (1998: 611) reconstructed **dhwerné-ye-ti* with an unaccented suffix influenced by causatives in *-éye-* following a suggestion from Melchert. The **t* in the ending *-*ti* in this reconstruction was lenited to **d* by the second lenition rule that operated between unaccented vowels in Proto-Anatolian and then affricated into lenited or short *-z-* before *i*.[22]

If the reconstruction of **dhwerné-ye-ti* is correct, the 3SG.PRES mediopassive *duwarnattari* is accounted for without any problems. Because the accent is fixed in the paradigm of denominative verbs, **dhwernéyor* (< **-ye-or*) will be naturally posited as a preform of the 3SG mediopassive. This preform would have undergone the loss of final *-r* and then come to take the innovative ending *-ttari*; hence, the actually attested *duwarnattari* (PA **dhwerné-yo-r* > **dhwerné-yo* → *duwarnattari*). However, Kloekhorst (2007: 456f. and 2008: 907) revived the nasal-infix formation 3SG *$dhur$-né-h_1-ti*, 3PL active *$dhur$-n-h_1-énti* and convincingly argued that the latter syllabifies as Hitt. *duu̯arnanzi*. According to him, the PIE sequences **CuRV* and **CuRCV* syllabify as Hitt. *CuRV* and *CuRCV* respectively, but the sequence **CuRCC* syllabifies as Hitt. *CuwaRCC* /CuəRCC/; cf. *kuu̯aršk̂e/a-* 'cut (imperfective)' < *k^wr-sk̂e/o-*. The latter syllabification applies to the 3PL *duwarnanzi* (< **dhur-n-h_1-énti*). The 3SG *duwarnezzi*, then, turns out to be analogical to the 3PL *duwarnanzi*, replacing an older **durnezi* (< **dhur-nǽ-tdi* < **dhur-nǽ-ti* < **dhur-né-h_1-ti*).[23] This view, however, makes it difficult to straightforwardly derive the 3SG.PRES mediopassive *duwarnattari* from its perform **dhwr̥-n-h_1-ór*, the phonologically regular outcome of which would be ***duwarnāri*.

8. Loss of word-final *-r* in Anatolian: a reformulation

A fundamental problem in *zinnattari* and *duwarnattari* is to explain why final *-r* dropped after the accented vowel in their respective preforms **ti-n-h_1-ór* and **dhwr̥-n-h_1-ór*. Phonologically and morphologically regular forms would be ***zinnāri* and ***duwarnāri*.

[22] As for the Proto-Anatolian lenition rules, see Eichner (1973) and Morpurgo-Davies (1982/3).
[23] In this analysis, the single *-z-* retained in the above-mentioned Old Hittite *du-wa-ar-ne-zi* is a regular phonological outcome created by the first lenition rule which operated after the accented long vowel in Proto-Anatolian. More detailed analysis of the Proto-Anatolian lenition rules will be given in the following section.

8.1. The loss of -r in Hittite nouns

In spite of the difficulty of providing *zinnattari* and *duwarnattari* with a reasonable historical derivation, it would not be attractive to regard the loss of final *-r* in Proto-Anatolian as an uncontrolled and sporadic rule because it is observed not only in mediopassive verbs, but also in nouns. The loss of final *-r* in Hittite nouns is observed in a number of examples represented by ^{NINDA}*wa-ge-eš-ša* 'loaf' KBo XVII 30 III 7, ^{LÚ}ŠU.GI-*eš-ša* 'old age' KBo XXII 1 Vs. 6, *ḫa-an-ne-eš-ša* 'case' KUB XXX 11 + KUB XXXI 135 Vs. 11, 13; KUB XII 63 Vs. 33, etc. Neu (1982) showed that forms without final *-r* are archaisms and that *-r* alternates with zero only after *-a-*. Accepting this remark, Melchert (1988) observes a functional difference between forms in *-ar* and *-a*: the forms in *-a* show a marked association with (collective) plural number. The ablaut of the IE *r*/*n*-stems suggests that the collective with unaccented **′-ōr* (< **′-or-h_2*) belongs to the amphikinetic inflection illustrated by IE 'water' NOM-ACC **wéd-ōr* (cf. Schindler 1975), while singulars still ended in syllabic **-r̥*. The distribution of the forms without *-r* limited to the plural is rationally explained by assuming the final *-r* loss was anterior to the rule **-r̥* > *-ar* as shown below.

(7)

	Singular	Plural
Proto-Anatolian	**-r̥*	**′-ōr*
Final *-r* loss	——	**′-ō*
**-r̥* > *-ar*	**-ar*	——
Hittite	*-ar*	*-a*

The restoration of final *-r* in the plural forms in later Hittite is due to the analogical influence from the singular *-ar*.

As shown above, the lack of *-r* in Old Hittite plural nouns is easily accounted for by incorporating the rule of final *-r* loss into their historical derivation. Accordingly, it should be stressed that this rule is indispensable, and it will be more promising to find a solution which will enable us to give a reasonable historical explanation to *zinnattari* and *duwarnattari* by reformulating the original rule with necessary modification.

8.1. A key to the solution

A key to the solution seems to lie in the corresponding 3SG.PRES active. The most well attested 3SG.PRES active forms of the verb *zinna-* are *zi-in-né-ez-zi* and *zi-en-né-ez-zi*. However, an invaluable form is recorded in an Old Hittite original manuscript. It is

zi-in-né-z[i] KBo XX 10 I 5, which shows intervocalic single *-z-*. Likewise, the verb *duwarna-* has *du-wa-ar-né-zi* KBo VI 3 III 70, with the intervocalic single *-z-* in a Neo-Hittite copy of an Old Hittite text in contrast to the more frequent *du-wa-ar-né-ez-zi*, *du-wa-ar-na-zi*, etc. What does the intervocalic single *-z-* in *zi-in-né-z[i]* and *du-wa-ar-né-zi* mean? Since *ez* is a very simple sign with only three strokes and neither *zi-in-né-z[i]* nor *du-wa-ar-né-zi* in question is recorded at the end of a line, the single *-z-* in these examples should not be due to orthographic reasons such as simplified spelling or lack of space on the clay tablet, but linguistic factors.[24]

The preforms of *zi-in-né-z[i]* and *du-wa-ar-né-zi* are **ti-né-h₁-ti* (> **tinǽti* by compensatory lengthening) and **dhwr̥-né-h₁-ti* (> **dhwr̥nǽti*) respectively, as shown above. Both of them came to have a lenited ending **-di* after the application of the first lenition rule in Proto-Anatolian. Later the lenited **-di* thus created underwent affrication, so that the single *-z-* with lenited quality is observed in *zi-in-né-z[i]* and *du-wa-ar-né-zi*.[25] What should not escape our attention is that they both had a long vowel before the ending, a necessary condition for the application of the first lenition rule. This observation is of immediate relevance to the problem of why final *-r* dropped after the accented vowel in **ti-n-h₁-ór* and **dhwr̥-n-h₁-ór*, as shown below. Rather than proceed directly to this problem, however, we turn first to the Proto-Anatolian lenition rules, a reformulation of which follows in the next two sections and has an important consequence for an accurate understanding of the prehistory of *zi-in-né-z[i]* and *du-wa-ar-né-zi*.

8.2. A reformulation of the Proto-Anatolian lenition rules

It is well known that the Proto-Anatolian first lenition rule operated after an accented long vowel and the second lenition rule between unaccented vowels. The first lenition rule is illustrated by the examples in (a) of the following table and the second lenition rule by those in (b).

[24] The single *-z-* in *du-wa-ar-na-zi* is, on the other hand, due to simplified spelling, which is typical of later Hittite manuscripts. Note that the sign *az* is much more complicated than *ez*.

[25] There are three additional examples in Old Hittite original manuscripts which show intervocalic single *-z-*, i.e. *ú-e-mi-zi* 'finds' KBo VI 2 IV 12 (< **au-ém-ye-di* < **au-ém-ye-ti*), *i-e-zi* 'does' KBo VI 2 I 60 (< **yǽ-di* < **yéh₁-ti*) and *pí-ḫu-te-zi* 'brings' KBo XX 10 I 4 (< **(pé)-h₂(e)u-dhǽ-di* < **(pé)-h₂(e)u-dhéh₁-ti*). They all satisfied the structural description to which the first or second lenition rule applied.

(8)		Hier. Luv.	Cun. Luv.	Lycian	PIE
	(a)		*a-ti* 'makes'	*adi*, *edi*	**yéh$_1$-ti* (> **yǽ-ti*)[26]
		á-tà, *á-ra+a* 'made'			**yéh$_1$-to* (> **yǽ-to*)
	(b)	*tu-pi-ti*, *tu-pi-ri+i* 'strikes'	*du-ú-pí-ti*	*tubidi*	**(s)towbhé-ye-ti*[27]
	(c)	*pi-ia-ta* 'gave'	*pí(-i)-ia-at-ta*	*pijetẽ*	**bhiHó-to*[28]

In (a) and (b), the endings include the rhotacised *r* alternating with *t* in Hieroglyphic Luvian, intervocalic single *-t-* in Cuneiform Luvian and the alphabetic *d* in Lycian, all of which point to Proto-Anatolian lenited **d*. On the other hand, none of the examples in (c) shows a lenited effect in the endings. The lack of lenition in the examples of (c) suggests a reconstructed form **bhiHó-to*, where the ending is immediately preceded by an accented short vowel.

The first and second lenition rules in Proto-Anatolian are formulated in the following manner.

(9) a) V́TV > V́DV

b) V́CVTV > V́CVDV[29]

These two rules at first glance seem to be independent of each other. But Adiego (2001: 14) suggests that the two lenition rules be revised by reinterpreting Proto-Anatolian long vowels as a sequence of two morae with the first mora accented. Following this suggestion, (9a) and (9b) are restated in the following manner.

(10) a) V́TV > V́DV → μ μ T μ > μ μ D μ

H L L H L L

b) V́CVTV > V́CVDV → μ C μ T μ > μ C μ D μ

H L L H L L

Furthermore, these two rules are collapsed into the following single rule in moraic

[26] Cf. Hittite *i-e-zi* discussed above.
[27] Cf. Melchert (1994: 265) for the reconstruction.
[28] Cf. Jasanoff (2003: 94) for the reconstruction.
[29] These rules are virtually identical to those formulated by Morpurgo Davies (1982/3: 262), who convincingly demonstrated that they applied to Common Luvian, but did not state any definite opinion on whether they go back to an earlier period. The discussions in section 8.2., however, favor the view that they operated in Proto-Anatolian. Furthermore, the two lenition rules probably applied to laryngeals though she limits their application to the dentals.

terms.[30]

(11) μ Tμ > μ D μ
L L L L

This rule says that Proto-Anatolian lenition occurred intervocalically between unaccented morae.[31] The effects of lenition are well preserved in the verbal system of the Luvian languages, whereas Hittite generalized the unlenited quality by analogy to such a large extent that the original phonological outcome is not retained with the exception of a small number of verbs discussed above, i.e. *zi-in-né-z[i]*, *du-wa-ar-né-zi*, *ú-e-mi-zi*, *i-e-zi* and *pí-ḫu-te-zi*.[32]

It has become clear from the discussion in this section that the two conditions for Proto-Anatolian lenition are unified in moraic terms thanks to Adiego's brilliant reformulation. However, there still remains the problem of the correlation between unaccented morae and lenited consonants, a detailed discussion of which follows in sections 8.4 and 8.5.

8.3.The feature [stiff vocal folds]

[30] Adiego (2001: 15) suggests that there are two possible interpretations of the phenomenon as shown below. Possibility 1: consonants are lenited between unaccented morae. Possibility 2: consonants are lenited between vocalic morae, but the presence of an adjacent accented mora blocks the process. In the former case the context in which the rule applies is included in the rule itself, whereas in the latter case the output overgenerated by a less conditioned rule is blocked by a constraint. Possibility 2 will be favored by scholars who believe that consonant types affect accents, not vice versa. Adiego considers that a choice between these two alternatives is difficult. But there are cases where accents affect consonant types as shown in section 8.4.

[31] The affected consonants must be followed by an unaccented mora. The following examples show that this is a necessary condition for the lenition. Hittite *šīwatt-* which means 'day' or 'the Sun God' with determiner indicating a god shows unlenited *-tt-* (gen. sg. ^{D}*Ši-i-wa-at-ta-aš* KBo XVII 15 Vs. 10), whereas its cognate forms in Cuneiform Luvian and Hieroglyphic Luvian show single *-t-* intervocalically and rhotacized *-r-*, respectively, which obviously represent lenited **d*; e.g. Cuneiform Luvian ^{D}UTU-*wa-ti* (dat. sg.) KUB XXXV 107 III 11 and Hieroglyphic Luvian DEUS.SOL-*ri+i*. Different qualities of the consonants are most easily explained by assuming an original amphikinetic ablaut pattern for the protoform of this noun with later leveling and the operation of the second lenition rule (Proto-Indo-European **dyéw-ot-È/*dyu-t-és* → Proto-Anatolian **dyéw-ot-È/*dyew-ot-és* > **dyéwod-/*dyewot-ˊ*). Hittite generalized the weak stem with **-t-* and the Luvian languages the strong stem with **-d-* in their individual histories; cf. Yoshida (2000). If this analysis is correct, it turns out that the second lenition rule does not work when the following mora is accented as seen in Proto-Anatolian **dyew-ot-és* > **dyewot-ˊ* of the above historical derivation.

[32] Regular phonological outcomes of the lenition followed by later affrication are also observed in Old Hittite *ma-a-ni-za* with single *-z-* (< **mắn-oi-ti*) 'when-they-(reflexive)' in contrast to *nu-uz-za* with double *-zz-* (< **nú-ti*); cf. Yoshida (2001: 727). The extra *za* sign in *nu-uz-za* besides Old Hittite *nu-uz* is particularly remarkable. There is no other plausible reason for use of the extra *za* except to indicate an unlenited quality of the final affricate.

It is typologically common for voiced obstruents to ben connected with low tone and voiceless obstruents with high tone. So-called tonogenesis, which is widely observed throughout East and South-East Asia in particular, is a phenomenon in which the tonal contrast in vowels has resulted from the loss of a prior voicing contrast in neighboring consonants. In Vietnamese, for example, the proto-language had syllables with final segments of three significant types: those ending in an open vowel or nasal, those ending in *-*h* and those ending in a glottal stop. In addition there was a voiced/voiceless distinction for its syllable-initial consonants as shown below.[33]

(12) Pre-Vietnamese (NO TONES)

pa	*pah*	*paʔ*
ba	*bah*	*baʔ*

By the sixth century, final -*h* and -*ʔ* had disappeared, so that a compensatory falling/rising distinction was created in the preceding vowel. At this point the language had a three-tone system.

(13) Sixth century Vietnamese (THREE TONES)

MID	FALLING	RISING
pa	*pà*	*pá*
ba	*bà*	*bá*

But by the twelfth century, the voiced/voiceless opposition for initial consonants was lost. To avoid the homophony caused by this merger, the number of tones became doubled from three to six: the voiced and voiceless stops left behind distinctive features of low and high pitch registers respectively, as shown below (the underscore _ = low register).

(14) Twelfth century Vietnamese (SIX TONES)

pa	*pà*	*pá*	HIGH
pa̲	*pà̲*	*pá̲*	LOW

Another example that shows mutual association between the tonal and voicing contrasts is seen in Jabem, a Melanesian language of New Guinea, where voiced obstruents occur only in low-toned syllables and voiceless obstruents only in high-toned

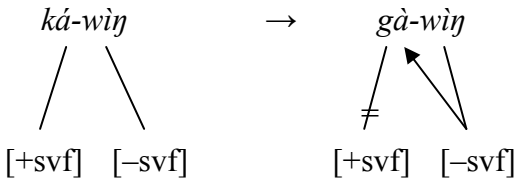
[33] The following statement is based on Haudricourt (1954: 81) and Matisoff (1973: 74f.).

syllables as illustrated below; cf. Poser (1981).

(15)	singular/realis	plural/irrealis	
	yɔ̀b	*yɔ́p*	'guard'
	yòb	*yóp*	'whistle'
	lòb	*lóp*	'fly'
	mèb	*mép*	'relieve oneself'
	mòb	*móp*	'decay'

In current phonological theories, the feature [stiff vocal folds] (abbreviated as [svf]) is used to distinguish, on the one hand, voiced from unvoiced obstruents and, on the other hand, high pitch from low pitch. It is noted that when the vocal folds are very stiff, vocal fold vibration is prevented and the fundamental pitch in vowels is raised. There are more cases where consonant types affect tones rather than the reverse as seen in the tonogenesis of Vietnamese, but cases where tones affect consonant types are observed as well. In fact Poser (1981) has shown that in Jabem a low-toned root preceded by an underlyingly high-toned prefix spreads its tone leftward to the prefixal syllable: e.g. *ká-wiŋ* > *gà-wiŋ* 'accompany (1SG realis)'. It is significant that not only the prefixal vowel becomes low, but also the initial consonant becomes voiced. Within a multidimensional framework in phonology this derivation is represented in the following diagram, where the feature [—stiff vocal folds] spreads from the root to the prefix.[34]

(16)



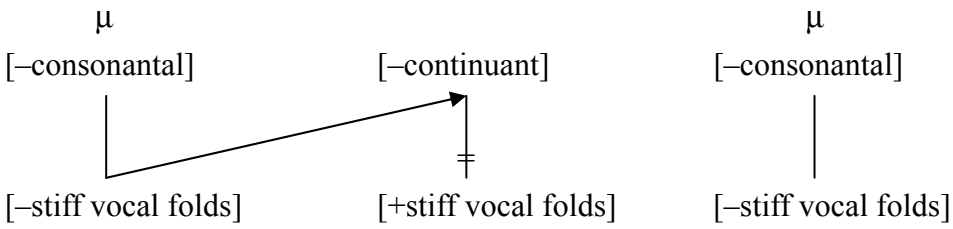
8.4. A modified version of the Proto-Anatolian lenition rule

On the basis of the discussion in the preceding section, the Proto-Anatolian lenition rule formulated by Adiego (cf. section 8.3) is now considered as another example in which the rhythmic prominence (an accent in the present case) affects consonant types. It is well known that the conditioning factor typical of lenition is a preceding vowel. For example,

[34] Another case in which the feature [stiff vocal folds] affects consonant types is discussed by Sims-Williams (1981: 13), who assumes that the survival of the unvoiced *-k* in Sogdian *βaγyā́k* 'divinity' in contrast to its loss in *xwā́tyā* 'weakness'(< *-ɣ < *-*k*) is attributed to the immediately preceding stressed *á*. I am grateful to my colleague Yutaka Yoshida for bringing this study to my attention.

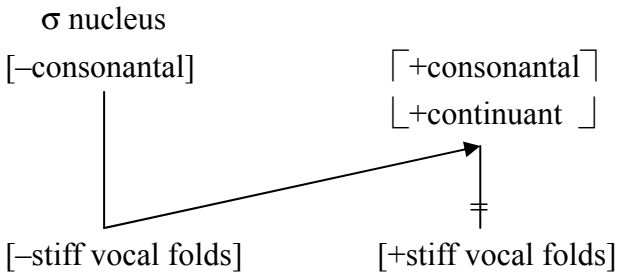
the Old Latin 3SG secondary ending *-*t* became lenited to -*d* after a vowel (e.g. *feced* 'made', *sied* 'would be'). Note also the different behaviors observed between Old Irish *a thúath* /a θu:aθ/ (< **esyo toutā*) 'his people' and *a túath* /a tu:aθ/ (< **esyās toutā*) 'her people', where lenition in the former example is explained by the preceding vowel.[35] Accordingly, it would be attractive to treat the Proto-Anatolian lenition rule in a way compatible with this general pattern of lenition. More specifically, progressive assimilation of the feature [–stiff vocal folds] discussed in section 8.4 is considered to be relevant in this rule. A modified version is illustrated in the following manner.

(17)



This representation is obtained by assuming that the feature [–stiff vocal folds] inherent in an unaccented mora spread to the immediately following voiceless stop which stands before another unaccented mora. The modified version of the Proto-Anatolian lenition rule is formally similar to the treatment of Verner's Law in Germanic (e.g. PIE *$ph_2tér$-*s* > *$patḗr$ > *$faθḗr$ > Gothic *fadar* 'father') by Calabrese & Halle (1998: 58ff.), which is represented in the following manner.

(18)



The only substantial difference between them is that the basic accent-bearing units are morae in the Proto-Anatolian lenition rule, but syllable nuclei in Verner's Law.

8.5. A reformulation of the loss of final -r in Proto-Anatolian

The assumption that the basic accent-bearing units in Proto-Anatolian are morae will certainly shed light on our primary problem in section 7, i.e. why *zinnattari* and

[35] The features [+voiced] and [+continuant], both inherent in vowels, spread to the following stops in the Latin and Old Irish examples, respectively.

duu̯arnattari lost final *-r* in their prehistories. An original version of the rule of final *-r* loss is that Proto-Anatolian final *-r* remained after an accented vowel. A new proposal to be drawn from the discussion earlier in this section is that final *-r* remained only after an accented short vowel (= after an accented mora). In other words, it dropped after an accented long vowel, which is reinterpreted as a sequence of accented and unaccented morae as in the case of the long vowel included in the first lenition rule in Proto-Anatolian. It is also reasonable to use the distinctive feature [stiff vocal folds] for marking an unaccented mora because it independently offers a natural explanation to the problem of the correlation between an unaccented mora and an lenited consonant. Thus, a new version is reformulated in the following manner.

(19) $r \rightarrow \emptyset$ / μ _____#
[–stiff vocal folds]

According to this rule, final *-r* was lost after an immediately preceding mora characterized by the feature [–stiff vocal folds].[36]

We are finally in a position to provide the Hittite 3SG.PRES mediopassive *zinnattari* and *duu̯arnattari* with a more precise historical explanation. It was observed in section 8.2 that their corresponding 3SG.PRES actives have the forms *zi-in-né-z[i]*and *du-wa-ar-né-zi* in Old Hittite. The intervocalic single *-z-* in them still preserves an archaic feature due to the first lenition rule that operated after an accented long vowel and subsequent affrication (**ti-né-h*$_1$*-ti* > **tinǽti* > **tinǽdi* → *zinnez[i]*, **dhur-né-h*$_1$*-ti* > **dhurnǽti* > **dhurnǽdi* → *duwarnezi*). It should be noted that these two forms were both characterized by the long vowel preceding the ending before the Proto-Anatolian lenition rule operated. The only reasonable way of explaining why final *-r* was lost in their prehistories is to assume that the mediopassives **tinór* (< **ti-n-h*$_1$*-ór*) and **dhwr̥nór* (< **dhwr̥-n-h*$_1$*-ór*) copied the vowel length from the corresponding actives **tinǽti* (or **tinǽdi*) and **dhurnǽti* (or **dhurnǽdi*) respectively before the loss of final *-r* occurred in Proto-Anatolian.[37] A phenomenon completely parallel to this morphological change from a typological viewpoint is seen in the ninth present class of Sanskrit verbs represented by the 3SG.PRES mediopassive *mathnīte* ‘shakes’ in contrast to its

[36] Lenition often results in the reduction of consonantal segments as seen in French *père* ‘father’ (< Latin *patrem*) in contrast to *padre* in Italian and Spanish, where a dental still remains. While the case of French *père* is due to a successive increase of sonority (or vowel-like character) of the relevant consonant, the rule of final *-r* loss has nothing to do with lenition. It should probably be treated as a simple deletion.

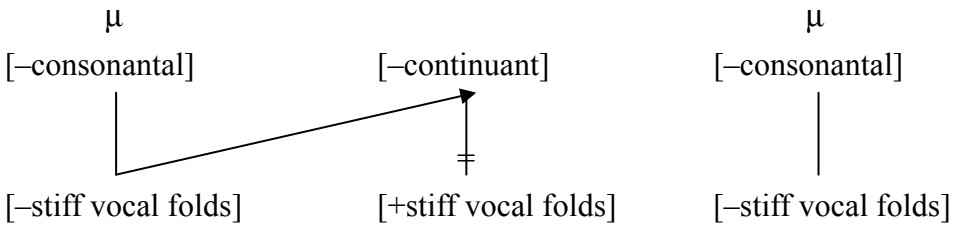
[37] The copy of vowel length, the loss of final *-r* and lenition are all dated to Proto-Anatolian. Although the copy of vowel length was anterior to the loss of final *-r*, it is impossible to determine the relative ordering of the lenition to the other two rules.

corresponding 3SG.PRES active *mathnā́ti*. The 3SG.PRES mediopassive theoretically reconstructed for this form should be **mn̥t-n-h₂-toi* with an interconsonantal laryngeal, which phonologically becomes short *i* in Sanskrit. However, the actually attested *mathnīte* has long *ī*, the length of which must be due to the corresponding active *mathnā́ti*.[38] Because Proto-Anatolian **tinnṓr* and **dhwr̥nṓr* created in the same way met the structural description for the new version of the rule of final *-r* loss, they became **tinnṓ* and **dhwr̥nṓ* without *-r*, to which the productive mediopassive 3SG ending *-ttari* was later attached.

9. CONCLUSION

As was stated at the outset of this paper, it is not easy by any means to obtain prosodic information from documents written in ancient languages, where native speakers are not available any more. Nevertheless, philological and linguistic analyses of the data shown above lead us to argue that Proto-Anatolian was a mora-based language. There are two independent pieces of evidence that support this claim. One is from Proto-Anatolian lenition and the other from the loss of final *-r* in Proto-Anatolian. Both phenomena are now accounted for by the following reformulated rules.

(20) Proto-Anatolian lenition:



(21) Proto-Anatolian word-final *-r* loss:

$$r \rightarrow \emptyset \;/\; \underset{[-\text{stiff vocal folds}]}{\mu} \;\_\_\_\_\_\; \#$$

In both reformulations the basic units that carry accents are morae. When the issues are placed in a moraic standpoint, consistent and *ausnahmslos* explanations become available. Furthermore, because the above reformulations are both characterized by the feature [stiff vocal folds], the speakers of Proto-Anatolian must have had this distinctive feature activated in their language faculty.

[38] Cf. Wackernagel (1896: 20). A different view is found in Jamison (1988: 224).

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